Public Health and the Law

Nuclear Weapons Testing Fallout: Proving Causation for Exposure Injury

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One of the unfortunate by-products of the advance of science and industry has been the exposure of populations to a growing array of hazardous substances. In recent years, this problem has been exacerbated by the very rapid rate at which new substances have been developed and introduced into the environment. Yet it is often several decades, if at all, before sufficient epidemiological evidence exists to authoritatively establish the harmful effects of a particular exposure. By that time, it is too late for those who have suffered adverse effects as the result of exposure to toxic chemicals, radiation, or drugs. To add insult to injury, these victims often also discover that the legal system is of little help to them; toxic tort litigation is fraught with scientific and jurisprudential roadblocks. A recent Federal District Court opinion dealing with exposure of civilians to fallout from atomic bomb testing more than two decades ago provides guidance on how court action may, in the future, address this problem.

Epidemiology and the Law

Toxic tort litigation has become "a major social and legal concern."[1] The best known examples of toxic tort litigation, involving asbestos and Agent Orange, are simply the tip of the litigation iceberg. Despite the pitiful condition of the plaintiffs involved in these cases, each and every plaintiff faces a tremendous difficulty: proving that his particular harm was the result of relatively low-level exposure to a particular source during a particular period of time. Not all harms of the type associated with toxic torts—cancers, leukemia, birth defects—are caused by such exposures and not all exposures cause such harm. As one expert active in radiation-related litigation put it:

> When we refer to radiation as a cause, we do not mean that it causes every case of cancer or leukemia. Indeed, the evidence we have indicating radiation in the causation of cancer and leukemia shows that not all cases of cancer are caused by radiation. Second, when we refer to radiation as a cause of cancer, we do not mean that every individual exposed to a certain amount of radiation will develop cancer. We simply mean that a population exposed to a certain dose of radiation will show a greater incidence of cancer than that same population would have shown in the absence of the added radiation.[2]

From an epidemiological point of view, this is a careful and sensible way to view a specific "cause" of cancer and certainly does not rule out inferring a cause-effect relationship. As one epidemiological text puts it, "While one-to-one specificity would add to the total weight of evidence supporting causal association, lack of specificity is of less significance."[3] But from a traditional tort law point of view, a statistical association is inadequate for proving causation. As one law review discussion put it, "A number of commentators have referred approvingly to the use of epidemiology or biostatistics, and a few courts have acknowledged the need to infer causation from comparisons between populations. To date, however, neither commentators nor courts have provided guidance on how to mesh law and epidemiology in a consistent way."[4]

Sometimes the rejection of statistical data has been extreme. In one recent case in which plaintiffs alleged that their cancers had been caused by low-level radiation, the judge rejected plaintiffs' expert witness because:

> "his analysis is not medical at all, but is only statistical . . . . The Court finds that . . . his book, and his testimony in this case, are not opinions to a reasonable degree of medical certainty, but rather are bare speculative, statistical analyses masquerading as medical opinions . . . . This Court finds by common sense that any statistical method which fails to include some obvious possible causative factors must yield a seriously flawed and untrustworthy end result."[5]

Atomic Bomb Testing

From January 1951 through July 1962, the United States government conducted 119 nuclear weapons tests at its Nevada Test Site in southern Nevada; 118 tests released radioactivity into the atmosphere. The detonations, with yields ranging up to 104 kilotons, created clouds of radioactive debris that descended to earth at different rates, carrying large numbers of radioactive fission products varying widely in dangerousness and length of time they would remain radioactive.

Some efforts were made to keep nearby populated areas from being showered with radioactive matter, primarily by avoiding detonations when wind conditions were unfavorable. But the information made available to nearby residents regarding possible protective actions was inadequate and misleading. One government pamphlet advised: "Your best action is not to be worried about fall-out."[6] Residents were therefore subjected to significantly high levels of potentially hazardous ionizing radiation for over a decade without any serious effort being made to protect them, decontaminate them, or even to monitor their exposure.

Twenty-five years later, close to 1,200 negligence liability claims were brought against the US government in the names of individuals who had resided near the Nevada Test Site and who subsequently developed cancer or leukemia. Because of the importance and complexity of the cases, the parties involved mutually agreed to the selection of 24

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This guest column was invited and accepted for publication by George J. Annas, JD, MPH, Editor of the Public Health and the Law section of the Journal.

"bellwether" cases "which when decided and reviewed may provide a legal and factual pattern against which the remaining issues in the pending case may be subsequently matched." The trial court's decision, announced in *Allen v. United States,*[7] is important not only because it represents the larger group of radiation exposure cases, but because the new legal approach it takes is potentially applicable in other areas of toxic tort litigation.

In *Allen,* the trial judge found that the government had had a duty to adequately monitor, warn, and educate the population put at risk by the tests and that it had failed to fulfill this duty. Its failure was monumental in its proportions.

> Unlike the national laboratories such as Oak Ridge, where the quantities of material involved were a tiny fraction of those released at NTS, no routine urine, fecal or blood samples were taken from residents of local areas exposed to significant measurable radioactive contamination. Not even in those circumstances where external exposures were estimated to meet or exceed the established safety guidelines . . . did the off-site personnel make any effort to check possible internal contamination among residents by direct methods. No thyroid or whole-body counters were constructed for use in screening members of the community—especially children—who may have been exposed to more than was permissible even for radiation workers. In fact, in the aftermath of [the dirtiest test], the monitors decided *not* to take a number of milk samples in order to avoid arousing public concern.[7]

Furthermore, the government actively misled the civilian population through the dissemination of flawed and incomplete information. In one instance, test-site workers were warned of potential danger of ionizing radiation, even at background levels, while the public was told that: "The body can withstand considerably greater doses of radiation than that from normal background because the effects are repaired almost as rapidly as they are produced."[8] The trial judge concluded that:

> "Operational negligence in the handling of the public information program effectively breached the legal duty to inform, to educate and to warn off-site residents of the increased hazards to which they were being exposed."

So the government had a duty toward plaintiffs, it breached that duty, and the plaintiffs had all suffered harm. But was the breach of the duty the cause of the harm? Was radioactive fallout responsible for the plaintiffs' cancers and leukemia?

The Allen Decision

Law students learn that to successfully prove causation, or proximate cause, in a negligence suit, a plaintiff must show that the defendant's actions directly, as a physical fact, caused the injury and that the circumstances surrounding the alleged negligence were such that the court should extend legal liability to this particular causal connection.

In *Allen,* the trial judge had a case that was "complicated by the nature of the injuries suffered (various forms of cancer and leukemia), the nature of the causation mechanism alleged (ionizing radiation from nuclear fallout . . .), the extraordinary time factors and other variables involved in tracing any causal relationship between the two." The judge noted that no direct causal connection could ever be proved, for "within the scope of our present knowledge, the injury is not specifically traceable to the asserted cause on an injury-by-injury basis."

Judge Bruce Jenkins, the trial judge, could have ended the matter at that point by ruling in favor of the defendant. Instead, he pursued an analysis of case law and legal commentary that allowed for the development of a less rigid standard of proof. Relying in particular on the legal writings of Professor A. Wayne Thode,[9] he adopted a new test, the "substantially demonstrated, reasonably exclusive, factual connection" test. The judge's review of case law from a variety of jurisdictions covering a variety of somewhat analogous fact situations supported his view that the common law does not demand simple cause-in-fact, that many courts have accepted factual connections short of this standard.

Judge Jenkins noted several cases as being instructive.[10–13] In each the plaintiff was unable to establish traditional causation-in-fact but was awarded damages after demonstrating a reasonably exclusive factual connection between the injury involved and the defendant's action. The judge noted that in several of these cases the courts involved had shifted the burden of proof from plaintiff to defendant, requiring that the defendant show that his actions were not a cause of the injury involved. In others, the courts had required some showing of actual connection short of cause-in-fact, followed by a shifting of the burden of rebuttal onto the defendants. Judge Jenkins noted in particular that such a shift was more likely when the court found the defendant to be primarily responsible for the lack of information necessary to establish causation. The *Allen* opinion, noting that the government was largely responsible for the lack of contemporaneous information regarding who received what dose of radiation from which tests, concluded that:

> "Where the injuries are causally indistinguishable, and where experts cannot determine whether an individual injury arises from culpable human cause or non-culpable natural causes, evidence that there is an increased incidence of the injury in a population following exposure to defendant's risk-creating conduct may justify an inference of 'causal linkage' between defendant's conduct and plaintiff's injuries."

Judge Jenkins discussed the analogous situations presented by recent efforts to compensate victims of contamination from toxic substances. His opinion speaks approvingly of a proposed (but not adopted) law which would have required the demonstration by plaintiffs of a "causal linkage" between their injury and the defendant's behavior, followed by a shifting of the burden to the defendant to rebut this implication.

After laying this foundation, Judge Jenkins set out the test of causation he would apply to the bomb test lawsuits:

> Where a defendant who negligently creates a radiological hazard which puts an identifiable population at increased risk, and a member of that group at risk develops a biological condition which is consistent with having been caused by the hazard to which he has been negligently subjected, such consistency having been demonstrated by substantial, appropriate, persuasive and connecting factors, a fact finder *may* reasonable conclude that the hazard caused the condition absent persuasive proof to the contrary offered by the defendant.

Thus the plaintiff's burden is to demonstrate the existence of "substantial, appropriate, persuasive and connecting factors." The defendant may then rebut this showing with proof to the contrary.

The *Allen* opinion goes on to state the more specific evidentiary showing against which each plaintiff's case will be judged:

> In this case, such factors shall include, among others: (1) the probability that plaintiff was exposed to ionizing radiation due to nuclear fallout from atmospheric testing at the Nevada Test Site at rates in excess of natural background radiation; (2) that plaintiff's injury is of a type consistent with those known to be caused by exposure to radiation; and (3) that plaintiff resided in geographic proximity to the Nevada Test Site for some time between 1951 and 1962. Other factual connections may include but are not limited to such things as time and extent of exposure to fallout, radiation sensitivity factors such as age or special sensitivities of the afflicted organ or tissue, retroactive internal or external dose estimation by current researchers, a latency period consistent with a radiation etiology, or an observed statistical incidence of the alleged injury greater than the expected incidence in the same population.

These are the factors the court looked to in judging the validity of each plaintiff's claim and determining whether or not it should be awarded or denied. The result was that 10 plaintiffs were found to have demonstrated, through presentation of the facts of their cases and of epidemiological evidence, a substantial causal connection, while the cases presented by the remaining 14 failed to do so.

Judicial Policy Choices

What choices were open to Judge Jenkins in *Allen?* He could simply have dismissed the case for failure to show a direct cause-in-fact connection. This is what another Federal District Court judge did in a case in which exposure to radiation from the venting of underground bomb tests was alleged to have caused leukemia. In that case, the judge agreed that the tests had been conducted negligently, but denied compensation because "statistical studies of the incidence and distribution of illnesses in the human population are not sufficient, as a matter of law or fact, to prove the cause of a particular case of cancer."[14] This would have been the simplest approach, making the fewest waves in the surface of existing law. The benefit offered by a simple, clear-cut cause-in-fact approach is that the outcome is predictable. Potential defendants know where they stand and the legal system avoids the spectacle of judges having to grapple with epidemiological evidence.

A second approach open to Judge Jenkins was a liberal interpretation of previous case law, bending past decisions to shift the burden of proof onto the defendant or permitting a presumption of negligence to be drawn from the fact of the injury itself. Such an approach could have been used to find in favor of all of the *Allen* bellwether plaintiffs. Certainly the government's chance of proving that it was *not* the cause of the various injuries is no less daunting a prospect as that which was faced by the plaintiffs.

Instead of taking either of these more traditional approaches, Judge Jenkins adopted an approach with strong policy connotations. Under this approach, the government's history of negligence, distortion, and cover up undercut its argument that the plaintiffs must assume the burden of traditional cause-in-fact proof. The judge then accepted the argument that responsibility for resolving the uncertainty inherent in these cases rested squarely on the shoulders of the court. He then proceeded to develop standards such that a decision on each plaintiff's case could be reached based upon the specific factors in that particular case.

Conclusion

The vitality of the *Allen* approach will be decided, in the first analysis, as it is appealed. Its value will also be measured by the readiness of other state and federal courts to follow Judge Jenkin's lead. If the *Allen* approach becomes a deadend, the future success of radiation-related and other toxic tort cases appears dim, and the victims of such problems may only find relief through statutory compensation mechanisms.

Theoretically the type of policy making engaged in by Judge Jenkins is a legislative responsibility. But there are several good reasons not to turn to the legislature when faced with toxic tort cases: 1) legislatures do not want such political hot potatoes and might find convenient excuses to duck or postpone reaching decisions; 2) legislative decisions on these matters would not result from full consideration of the range of policy implications but, instead, would likely be determined entirely on a political basis; and 3) legislative actions tend to offer only "generic" solutions, which can be equitable only if too tight or too loose in their criteria.

It is only through case-by-case decision making, by courts reviewing all of the evidence in specific cases and tailoring results to best fit the specific facts, that equitable solutions can be applied in an optimal number of cases. A major significance of *Allen* is Judge Jenkins' effort to preserve this case-by-case approach. In addition, he was able to do so in a way that carefully developed a middle-ground between the undesirable extremes of across-the-board compensation even where proof is suspect and failure of compensation for all even where the causal connection seems strong.

If the courts are to succeed as a forum for dealing with harm caused by toxic exposures, it will have to be through the development of a respectable body of case law. The decision in *Allen v. United States* makes an important early contribution to the case-by-case development of such a body of law. Should this indeed signal a trend, *Allen's* attention to statistical association suggests more sophisticated input from epidemiologists and statisticians than allowed under the all-win or all-lose approaches.

REFERENCES

1. Black B, Lilienfeld D: Epidemiologic proof in toxic tort litigation. Fordham L. Rev. 1984; 52:733.
2. Quoted in *Allen v. United States,* 588 F. Suppl 247 (D. Utah 1984) at 405.
3. Mauser J, Bahn A: Epidemiology: An Introductory Text. Philadelphia: WB Saunders, 1974, p 102.
4. Black and Lilienfeld, note 1, *supra,* pp 746–747.
5. *Johnston v. United States,* 597 F. Suppl. 374 (1984) at pp 413 and 412.
6. Atomic Energy Commission, *Atomic Test Effects in the Nevada Test Site Region,* 1955, p 23, as cited in *Allen v. United States,* note 2, *supra,* at 393.
7. 588 F. Suppl 247 (D. Utah 1984).
8. Atomic Energy Commission, *Atomic Tests in Nevada,* 1957, p 51, as cited in *Allen v. United States,* note 2, *supra,* at 398.
9. Thode AW: Tort analysis: Duty-risk vs. proximate cause and the rational allocation of functions between judge and jury. Utah L. Rev. 1977; 1977:1.
10. *Summers v. Tice,* 33 Cal.2d 80, 199 P.2d 1 (1948).
11. *Ybarra v. Spangard,* 25 Cal.2d 486, 154 P.2d 687, 161 A.L.R. 1258 (1944).
12. *Basko v. Sterling Drug,* 416 F.2d 417 (2d Cir. 1969).
13. *Sindell v. Abbott Laboratories,* 26 Cal.3d 588, 607 P.2d 924, 163 Cal. Rptr. 132 (1980), *cert. denied,* 449 U.S. 912 (1980).
14. *See* Titus AC: Governmental responsibility for victims of atomic testing: A chronicle of the politics of compensation. J Health Politics, Policy and Law 1983; 8:277.